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(54) **Moulding a soft toy having deformable limbs**

(57) The soft toy figure such as a miniature horse, person, or bird is moulded by firstly moulding a pre-formed body blank of smaller dimensions than that of the toy body from inexpensive polymeric or other material e.g. polypropylene, with at least one e.g. two or four lengths of malleably bendable wire projecting therefrom and extending in the same general direction, and then locating the blank in a mould for the toy, whilst maintaining all parts of said blank spaced from the walls of said mould, and moulding a rubbery material e.g. a neoprene polypropylene compound, around the blank and wires to provide the outer body portion and limbs of the figure.

The toy may be a horse, with the wires corresponding to the respective four horse legs, and the blank being located spaced from the toy mould walls, by two pegs and a knife which leave two apertures and a slit in the moulded toy, one of the apertures being plugged and a tail and a mane respectively being located in the remaining aperture and the slit.

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MOULDING METHOD

5 This invention relates to a method of moulding which is particularly suitable for moulding soft toy animals and other figures which have deformable limbs.

There is a demand for toy figures, such as horses, to be made from soft rubbery material, and to have deformable limbs, which, when deformed, will maintain their deformed
10 position, so that the animal can be made to take up various different positions. Ideally, the outer skin of the figure should be moulded from a material such as SANTOPRENE (Registered Trade Mark) which is a blend of neoprene (about 85%) and polypropylene (about 15%). This material has a
15 soft, matt finish which is attractive, and the material can be provided in different colours. In order to enable the limbs to maintain any desired configuration, a flexible strip of malleable material such as wire is located within each limb.

20 Traditionally, such toy figures have been manufactured using a type of gravity and manual moulding process to produce a skin of latex rubber. The mould is partially filled with the latex rubber material, then shaken to ensure a complete covering of the mould surface, and then, after
25 the latex rubber material has solidified sufficiently, the "skin" is removed from the mould. In a subsequent operation the skin is slit open, wires are inserted into the limbs, and the whole is then stuffed with foam or other material such as felt, and the opening is closed to produce the end
30 product. This is very satisfactory to look at, but extremely time consuming to make, and hence expensive.

It is extremely difficult to mould such toy figures in solid material because of shrinkage problems, and in any event, to make such figures of solid rubbery material would
35 be extremely expensive.

It might be possible to manufacture the figures using an injection moulding technique, with the wires being carried by a plate within the mould, but almost certainly,

the legs would have to be moulded in a separate operation and then combined in a separate operation with the body, which itself might have to be formed in two halves and then stuck together.

5 The present invention seeks to provide a less expensive method of producing toy figures with readily deformable limbs which maintain their deformed position, yet which figures have a rubbery surface, and which are moulded to permit accurate reproductions of the features of the real
10 creature or other article which the figure is intended to resemble.

According to the present invention, we provide a method of forming a figure having at least one deformable limb which will maintain its deformed position, comprising
15 first forming a blank by placing at least one malleable deformable strip into a mould for the blank which has overall respective dimensions less than any equivalent dimensions of the figure, moulding the blank from an inexpensive polymer or other material so that the said at
20 least one strip is located in said material with a part of the said strip, which will be located in a limb of the figure to be deformed, projecting from the blank, placing said blank in a mould for said figure with the projecting strip located in that part of the mould which will provide
25 the deformable limb, suspending said blank at at least one location so that it does not touch any surface of the mould, and then moulding a rubbery material around said blank.

Preferably, the rubbery material is a compound of neoprene and polypropylene sold under the Registered Trade
30 Mark SANTOPRENE (but other rubbery materials such as ethylvinylacetate could be used) and the blank is moulded from an inexpensive thermoplastics material such as polypropylene.

Preferably, the strip is wire, such as 16 gauge wire
35 formed of soft iron. The blank may comprise a moulded slug of inexpensive material which will form the central part of a four legged animal, in which case it would be formed with four wires projecting from its underside. The four wires

would then subsequently be located in the legs of the subsequently moulded animal. After moulding the slug, the four wires are then located in respective leg portions of a mould for the animal, and an outer surface of the body of the animal is then moulded around the blank from said rubbery material together with its legs and its head and neck, all in a single moulding operation.

Preferably, the blank is located in the mould for the rubbery material at three spaced locations by means of two pegs and a knife, said pegs and knife leaving in the moulded body of the figure two apertures and a slit. In a subsequent operation, one of said apertures may be plugged, and the other aperture may have a tail located therein, and a mane - when the figure resembles a horse - may be secured within said slit, the other aperture and slit accordingly being appropriately located.

Also according to the present invention, we provide a method of moulding a figure such as a miniature horse, comprising the steps of taking a pre-formed body blank made from inexpensive polymeric or other material and having at least two lengths of wire projecting therefrom and extending in the same general direction, placing said pre-formed body blank in a mould having the desired features of the figure with each length of wire located centrally of a respective limb portion of the mould, maintaining all parts of said blank spaced from the walls of said mould, and moulding a rubbery material around the blank and wires to provide the outer body portion and limbs of the figure.. Preferably, prior to the pre-formed body blank being placed in the mould, the wires at least are placed in a jig to shape and pre-set the projecting wires in position. Preferably, the figure resembles a horse and the blank has four projecting wires, one for each leg, and the method includes subsequently fitting a tail and mane to the moulded body.

Preferably, the mane and tail are located in apertures left in the moulded body by two supports which maintain the blank spaced from the walls of the mould during the moulding of the rubbery material.

Preferably, the blank is shaped to represent the torso of the body of the horse, but smaller than the torso.

The present invention also extends to a figure and a toy horse manufactured in accordance with the method of the
5 invention described above.

It will of course be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

10 For example, the method could be used to manufacture toys representing other animals, people, birds or the like.

CLAIMS:

1. A method of forming a figure having at least one deformable limb which will maintain its deformed position,
5 comprising:

first forming a blank by placing at least one malleable deformable strip into a mould for the blank which has overall respective dimensions less than any equivalent dimensions of the figure;

- 10 moulding the blank from an inexpensive polymer or other material so that the said at least one strip is located in said material with a part of the said strip, which will be located in the limb of the figure to be deformed, projecting from the blank;

- 15 placing said blank in a mould for said figure with the projecting strip located in that part of the mould which will provide the deformable limb;

suspending said blank at least one location so that it does not touch any surface of the mould; and

- 20 then moulding a rubbery material around said blank.

2. A method of forming a figure according to claim 1, in which the rubbery material is a compound of neoprene and polypropylene.

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3. A method of forming a figure according to claim 1 or claim 2, in which the blank is moulded from an inexpensive thermoplastics material, such as polypropylene.

- 30 4. A method of forming a figure according to any one of claims 1 to 3, in which the said at least one strip is wire.

5. A method of forming a figure according to claim 4, in which the wire is 16 gauge wire formed of soft iron.

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6. A method of forming a figure according to any one of claims 1 to 5, comprising:

moulding a slug of inexpensive material to form said

blank;

forming the blank with four strips projecting from its underside, said strips being four wires;

5 locating the four wires in respective leg portions of a mould for a four legged animal; and

moulding an outer surface of the body of said animal from said rubbery material, around the blank, together with legs, head and neck for a four legged animal, all in a single moulding operation.

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7. A method of forming a figure according to any one of claims 1 to 6, further comprising locating the blank in a mould for the rubbery material at three spaced locations by means of two pegs and a knife, said pegs and knife leaving
15 in the moulded body of the figure, two apertures and a slit.

8. A method of forming a figure according to claim 7, in which said figure is a horse, further comprising:

plugging one of said apertures;

20 locating a tail within the other aperture; and

securing a mane within said slit, the other aperture and slit accordingly being appropriately located.

9. A method of moulding a figure, comprising the steps
25 of taking a pre-formed body blank made from inexpensive polymeric or other material and having at least two lengths of wire projecting therefrom and extending in the same general direction, placing said pre-formed body blank in a mould having the desired features of the figure with each
30 length of wire located centrally of a respective limb portion of the mould, maintaining all parts of said blank spaced from the walls of said mould, and moulding a rubbery material around the blank and wires to provide the outer body portion and limbs of the figure.

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10. A method of forming a figure according to claim 9 further comprising, prior to the blank being placed in the mould, placing at least the wires in a jig to shape and pre-

set the projecting wires in position.

11. A method of forming a figure according to claim 9 or claim 10, in which said figure resembles a horse, the blank
5 has four projecting wires, one for each leg, and a mane and a tail are located in apertures left in the moulded body by two supports, which maintain the blank spaced from the walls of the mould during the moulding of the rubbery material.
- 10 12. A figure having at least one deformable limb which will maintain its deformed position, manufactured in accordance with the method of any one of claims 1 to 8.
13. A figure manufactured in accordance with the method
15 of any one of claims 9 to 11.
14. A method of forming a figure having at least one deformable limb, substantially as hereinbefore described.
- 20 15. A method of moulding a figure substantially as hereinbefore described.